

***Acacia* Miscellany 13. Taxonomy of some Western Australian phyllocladinous and aphyllodinous taxa (Leguminosae: Mimosoideae)**

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Abstract

B.R. Maslin. *Acacia* Miscellany 13. Taxonomy of some Western Australian phyllocladinous and aphyllodinous taxa (Leguminosae: Mimosoideae). Nuytsia 10 (2): 151-179 (1995). Descriptions are provided for eleven endemic Western Australian species of *Acacia* characterized by phyllodes which are either decurrent on the stems and forming prominent opposite wings, or which are reduced to scales or minute, horn-like projections. Seven new species and two new infraspecific taxa of *Acacia* are described, namely, *A. aemula* Maslin which comprises two subspecies, subsp. *aemula* and subsp. *muricata* Maslin (syn. *A. tetragonocarpa* var. *scabra* Benth.), *A. alata* var. *tetrantha* Maslin, *A. applanata* Maslin, *A. bifaria* Maslin, *A. carens* Maslin, *A. cerastes* Maslin, *A. cummingiana* Maslin and *A. pterocaulon* Maslin. The taxonomy of *A. alata* R. Br. is briefly assessed and the species is now viewed as comprising four varieties, namely, var. *alata*, var. *biglandulosa* Benth., var. *platyptera* (Lindl.) Meisn. and var. *tetrantha* Maslin. A description is provided for *A. volubilis* F. Muell.; this species is possibly extinct and seems related to *A. aemula*. *Acacia glaucoptera* Benth., a close relative of *A. bifaria*, and *A. willdenowiana* H. Wendl. (based on *A. diptera* Lindl.), a close relative of *A. applanata*, are lectotypified.

Introduction

The species included in this paper are endemic in Western Australian and most are characterized by phyllodes which are either decurrent on the stems and forming prominent opposite wings, or which are reduced to scales or minute, horn-like projections. Not all species with these characteristics are included here, only those that need to be formalized so that the names are available for inclusion in the forthcoming "Flora of Australia" treatment of *Acacia*.

Bentham (1864) recognized two series, *Continuae* Benth. and *Alatae* (Benth.) Benth., to accommodate the relatively few species of *Acacia* with continuous or decurrent phyllodes. The *Continuae* has long been recognized as an artificial group but the *Alatae* was accepted in Pedley's (1978 & 1986) classifications as a distinct section. Prior to 1978 Vassal (1972) had proposed a new classification of *Acacia* in which a number of new infrageneric taxa were recognized. One of these, section *Pulchelloidea* Vassal, was created to accommodate certain species from a number of Bentham's (1864) series (including the *Alatae* and *Continuae*). However, the results of preliminary

cladistic analyses of *Acacia* by Chappill and Maslin (1995) suggest that both the *Pulchelloidea* and *Alatae* are polyphyletic assemblages; decurrent phyllodes were interpreted as a highly homoplastic feature. This result is consistent with the findings of Pettigrew and Watson (1975) and indicate that it is unlikely the *Alatae* or *Continuae* will be recognized as formal, higher-order categories in future classifications.

There are six species included below under the heading "Phyllocladinous taxa". Although these species all have decurrent phyllodes that form prominent, opposite wings along the stems they are not all closely related to one another. *Acacia bifaria* sp. nov. and its close relative *A. glaucoptera* Benth. differ significantly from the others, particularly in carpological features; these two species are related to the *A. merrallii* F. Muell. group whose members do not have winged stems and only rarely have decurrent phyllodes. *Acacia applanata* sp. nov. is closely related to *A. willdenowiana* H. Wendl. and taxonomically not far from *A. alata* R. Br. The precise affinities of *A. pterocaulon* sp. nov. are not altogether clear.

Bentham's (1864) classification included three species where the phyllodes were reduced to scales; these were included in series *Pungentes* subseries *Aphyllae* Benth. (*A. spinescens* Benth.) and series *Calamiformes* subseries *Subaphyllae* Benth. (*A. tetragonocarpa* Meisn. and *A. restiacea* Benth.). Neither of these subseries has been recognized in the recent classifications of *Acacia* and there are no indications that aphyllodinous taxa (of which there are about five now recognized) represent a monophyletic group.

Of the five species included below under the heading "Aphyllodinous taxa" only *A. cummingiana* sp. nov. has all its phyllodes reduced to horizontally flattened scales (like those found in *A. tetragonocarpa*). It seems likely that in these two species at least the scales are homologous to fused phyllodes and stipules (see note under *A. cummingiana*). While *A. aemula* sp. nov. has for the most part normal phyllodes (which closely resemble the branchlets) a few terminal ones are sometimes reduced to horizontally flattened scales. In *A. carens* sp. nov. and *A. cerastes* sp. nov. the phyllodes are very rudimentary and are represented by minute, stipule-like or horn-like projections. *Acacia volubilis* F. Muell., which like *A. aemula* has distant, normal phyllodes which resemble the branchlets, is included within this group for comparative purposes because the name had until now commonly been misapplied to some of the new species described in this paper.

Methods

The taxa included in this paper are arranged alphabetically under two headings, Phyllocladinous taxa and Aphyllodinous taxa. My approach to both typification and the application of rank are discussed elsewhere (Maslin and Cowan 1994a, Cowan and Maslin 1995).

Phyllocladinous taxa

1. *Acacia alata* R. Br. in W.T.Aiton, Hortus Kew. ed. 2, 5: 464 (1813)

Mimosa alata (R. Br.) Poir. Encycl. Meth. (Bot.) Suppl. 5: 530 (1817), *nom. inval.* (combination not actually made); *Phyllodoce alata* (R. Br.) Link, Handbuch 2: 132 (1831); *Acacia alata* var. *genuina*

Meisn. in J.G.C. Lehmann, Pl. Preiss. 1: 4 (1844), *nom. inval.* *Lectotype* (see Maslin and Cowan 1995): “*Mimosa platycaulis*.” Observatory Hill, Princess Royal Harbour, Albany, Western Australia, December 1801, R. Brown (BM - upper right hand flowering specimen on sheet titled “Iter Australiense, 1802-5” and bearing [Britten no.] 4314; *isolecto*: K, E. *Paralectotype*: sterile and fruiting specimens mounted with lectotype and *isolecto*type at BM, K and E.

A. uniglandulosa Seem. & J.A. Schmidt, Flora 27: 495 (1844). *Typus*: cultivated at Hanover botanic garden in 1844, as *A. latifrons*; *holo*: HBG, specimen ex herb. J.A. Schmidt.

?*A. alata* var. *glabrata* Hort. ex Seem., Verh. K.K. Gartenbauges. Wien 1846: 9 (1846). *Typus*: none cited (*n.v.*).

Much-branched *shrubs* to c. 2 m tall. Branchlets often flexuose. *Stipules* spinose to innocuous. *Phyllodes* continuous with branches, bifariously decurrent and forming opposite wings with each one extending to the next below, the wings usually 2-20 mm wide, narrowest on inflorescence-bearing region, thinly coriaceous, slightly undulate, green, glabrous to pilose or hirsute-hirsutellous, commonly tuberculate-scabridulous on margins; free portion of phyllodes 5-70 mm long, sometimes acuminate and/or uncinat, apical points spinose to innocuous, central nerve obvious. *Glands* 1-3 along adaxial margin of free portion of phyllode, prominent, each normally situated at apex of a triangular spur. *Peduncles* mostly 2 per axil, sometimes in racemes, 4-12 mm long, glabrous or hirsutellous to shortly pilose; *heads* globular, 4-15-flowered, white to golden. *Flowers* 5-merous, the buds obtuse to acute; *calyx* gamosepalous. *Pods* stipitate, 2-8 cm long, 5-11 mm wide, crustaceous, normally curved, flat, densely hairy, margins thick. *Seeds* transverse to oblique, oblong to elliptic, 2.5-4.5 mm long, arillate.

Distribution. Occurs from Port Gregory (c. 70 km north of Geraldton) south to Albany, southwest Western Australia.

Affinities. *Acacia alata* is related to *A. willdenowiana* from which it is most readily distinguished by the free portion of the phyllodes having one or more prominent gland-bearing angles along its upper margin and an obvious central nerve.

Infraspecific taxa. As defined here *A. alata* comprises four varieties; however, this should be viewed as an interim classification until further studies can be undertaken to ascertain if this is an appropriate rank for these taxa. Variety is used as a rank of convenience and has been adopted simply because two varieties had already been recognized within the species. The name var. *biglandulosa* Benth. has long been applied to the distinctive form of the species occurring in the Geraldton district. However, in preparing the “Flora of Australia” treatment of *A. alata* it became evident that plants with large, rather soft, \pm innocuous phyllodes which occurred predominantly in areas just north of Perth cannot be easily accommodated within what remained as var. *alata*. Consequently, var. *platyptera* (Lindl.) Meisn. (restricted to near Mogumber) is here resurrected and var. *tetrantha* (Eneabba-Cervantes and Yanchep) is described as a new variety. Additionally, two informal variants are recognized, one allied to var. *platyptera* (restricted to the Tuttanning Flora Reserve near Pingelly) and the other allied to var. *biglandulosa* (restricted to a small area east of Mingenew); further studies are needed to confirm the status of these variants.

Key to varieties of *A. alata*

1. Free portion of phyllodes with 2 or 3 gland-bearing angles, sharply pungent; heads 4-7-flowered 1b. var. *biglandulosa*
- 1a. Free portion of phyllodes with 1 gland-bearing angle (rarely 2 or 3 in var. *tetrantha*) 2
2. Heads 4-flowered; free portion of phyllodes 10-70 mm long, innocuous or scarcely pungent 1d. var. *tetrantha*
- 2a. Heads more than 4-flowered 3
3. Free portion of phyllodes 5-20 mm long, sharply pungent 1a. var. *alata*
- 3a. Free portion of phyllodes 10-70 mm long, acuminate to caudate-acuminate, innocuous or slightly pungent 1c. var. *platyptera*

1a. *Acacia alata* R. Br. var. *alata*

Illustrations. H.L. Wendland, Comm. Acac. Aphyll. t. 1 (1820); A. Colla, Hortus Ripul. t. 17 (1824); H.G.L. Reichenbach, Mag. Aesth. Bot. [Mag. Gart.-Bot.] 2: pl. 88, fig. 1 (1825); R. Erickson *et al.*, Fl. Pl. W. Australia 2nd edn, 50 (1979); M. Simmons, Acac. Australia 1: 19 (1981), left hand illustration.

Shrubs 0.5-1.5 m tall. *Stipules* spinose or sub-spinose. *Phyllodes* on non-flowering region of stems 2-10 mm wide; free portion of phyllodes 5-20 mm long, apex spinose. *Peduncles* glabrous or hairy; *heads* 6-10-flowered, creamy white to lemon yellow, occasionally golden.

Selected specimens examined. WESTERN AUSTRALIA: Mount Clarence, Albany, A.M. Ashby 4325 (PERTH); c. 6 miles [c. 10 km] W of Three Springs, 27 June 1974, C. Chapman (MEL, PERTH 00723061); 6 miles [c. 10 km] W of Sullivan Rock, along track from picnic area on Albany Highway, R.J. Cumming 971 (PERTH, TLF); 26 miles [41.8 km] E of Irwin Inlet, near Denmark, 19 February 1913, S.W. Jackson (CANB, K, MEL, PERTH 00723622, TLF); Dingo Beach Track, West Cape Howe, 25 km W of Albany, G.J. Keighery 8755 (PERTH); Cape Leeuwin, F. Lullfitz L2052 (PERTH); c. 6 miles [c. 10 km] S of Mount Williams, B.R. Maslin 432 (MEL, PERTH); 1.6 km due S of Palgarup, B.R. Maslin 2851 (MEL, PERTH); 2 km N of Mundijong township on Soldiers Road, B.R. Maslin 6157 (CANB, PERTH); NE of Yallingup, S. Paust 205 (PERTH); Canning River, L. Preiss 997 (LUND, MO, W); Cookernup, R.D. Royce 3842 (PERTH); Helena Valley, J. Seabrook 41 (CANB, PERTH); near Hamelin Bay, 13 August 1975, R. Tinetti s.n. (PERTH 00867470); between Cowaramup and Margaret River, D.J.E. Whibley 5064 (AD, PERTH). CULTIVATED: Kew Gardens, 1808, [W. McNab] (DBN, photo PERTH), see Maslin and Cowan 1995.

Distribution. Southwest Western Australia occurring mainly in the Darling Botanical District with an outlier in the Irwin Botanical District (1:250,000 maps H50-6,14; I50-2,5,6,9,10,11,15). This variety has a discontinuous distribution, occurring from Perth south to Collie, from Cape Naturaliste (c. 30 km west-northwest of Busselton) southeast to Manjimup, and from Denmark east to Albany, with an outlier at Three Springs (c. 200 km north of Perth).

Habitat. Grows in a variety of habitats but often along creeks with laterite or loam in forest and woodland in the Darling Range, and in sand over granite in coastal heath and low woodland near Albany.

Flowering and fruiting periods. Flowers have been recorded from May to December, with the main flush occurring between June and October. Pods with mature seeds have been collected in November and January.

Variation. Peduncles on specimens from Cape Naturaliste to Albany are hirsutellous to shortly pilose, further north they are normally glabrous. Smallest pods occur on plants from around Albany, i.e. 2-4 cm long and 5-6 mm wide.

Hybrids. Appears to hybridize with *A. applanata* in a few places in the Darling Range near Perth (see *A. applanata* below for discussion).

Conservation status. Widespread, not considered rare or endangered.

Cultivation. Widely cultivated in Europe last century, sometimes as *A. scolopendria* which is presumed to be a *nomen nudum*.

1b. *Acacia alata* var. *biglandulosa* Benth., Fl. Austral. 2: 321 (1864)

Syntype: Port Gregory, Western Australia, *A. Oldfield* (K, sheet stamped "Herbarium Hookerianum 1867"), see discussion below.

Illustration. M. Simmons, *Acac. Australia* 1: 19, pl. 15 (1981), right hand illustration.

Shrubs 0.5-1.5 m tall. *Free portion of phyllodes* to 5-20 mm long, apex spinose. *Glands* 2 or 3, normally shortly stipitate, sometimes becoming spinose. *Peduncles* usually hirsutellous; *heads* 4-7-flowered, cream to white; buds pink.

Selected specimens examined. WESTERN AUSTRALIA: near Nanson on Howatharra-Nanson road, *A.M. Ashby* 3804 (CANB, K, PERTH); c. 16 miles [c. 25.7 km] NNE of Geraldton on the road to Nabawa, *R. Coveny* 3049 (NSW, PERTH); 12.3 km N of junction of Yerina Springs road with Port Gregory-Northampton road, *R.S. Cowan* A845 with *R.A. Cowan* (CANB, K, MEL, NSW, NY, PERTH, US); 10 miles [16 km] S of Northampton, North West Coastal Highway, *R. Filson* 8684 (MEL, PERTH); Mount Michael on Walkaway-Nangetty road just E of Burma road junction, *S.D. Hopper* 4771 (PERTH); 30 miles [48 km] E of Geraldton, *J. Long* 290 (PERTH); Eradu turnoff on Mullewa Road, *R.D. Royce* 8025 (PERTH).

Distribution. Southwest Western Australia in the Irwin Botanical District (1:250,000 map H50-1). Occurs from Port Gregory south to Mount Michael (c. 35 km southeast of Geraldton).

Habitat. Grows in loam and sand on lateritic and sandstone hills and also in sometimes saline clay, usually in heath.

Flowering and fruiting periods. Flowers have been recorded from May to October, with the main flush occurring between June and September. Pods with mature seeds have been collected once, in October.

Typification. Bentham (1864: 321) based his brief description of this variety on material located "Amongst Oldfield's and other specimens." The only specimen I have seen which can be regarded

as original material is the syntype cited above. This sheet is annotated (? by Bentham) as "*Acacia alata* var." and was determined as holotype by A.B. Court on 24 November 1966. Judging from the type citation it is probable that further original material of var. *biglandulosa* will come to light in time.

Variation. Peduncles are glabrous on specimens from near Port Gregory (including the type), elsewhere they are hirsutellous.

A population from about 15 km east of Mingenew is treated here as a variant of var. *biglandulosa*, however, future studies may possibly show that it warrants formal status; this site is c. 70 km southeast of the most southerly known population of var. *biglandulosa*. These plants differ most obviously from var. *biglandulosa* in having a preponderance of phyllodes with only a single gland (although occasionally some have two glands) and light golden heads. Although the phyllodes have spinose tips and stipitate glands like var. *biglandulosa* the phyllode shape and size is sometimes very similar to var. *platyptera* which occurs much further south. Specimens examined: *B.R. Maslin* 6237 & 6237A and *A. Carr* 40 (all PERTH).

Conservation status. Typical var. *biglandulosa* is not known to be under threat.

1c. *Acacia alata* var. *platyptera* (Lindl.) Meisn. in J.G.C. Lehmann, Pl. Preiss. 1: 4 (1844)

A. platyptera Lindl., Edwards' Bot. Reg. 27: misc. 3 (1841). *Type citation*: "A greenhouse shrub from the Swan River, recently raised in the Exeter nursery, by Messrs. Lucombe Pince, and Co." (holo: CGE, sheet annotated "*A. platyptera*" by Lindley but without collection details).

Illustration. W.J. Hooker, Bot. Mag. 68: t. 3933 (1842), but not a good representation of the species in that the free portion of the phyllodes is shorter than normal.

Shrubs 0.5-1 m tall and forming dense clumps 1-2 m across. *Stipules* innocuous. *Phyllodes* 7-20 mm wide or occasionally 40 mm towards base of stems, narrower on inflorescence-bearing region; free portion of phyllodes acuminate to caudate-acuminate, 1-7 cm long, longest at base of stems, straight to shallowly recurved, apical points innocuous or slightly spinose and frequently recurved. *Glands* 1. *Peduncles* hirsutellous; heads 12-15-flowered, golden; *flower buds* obtuse. *Pods* 10 mm wide.

Other specimens examined. WESTERN AUSTRALIA: north of Mogumber [precise localities withheld for conservation reasons] *C. Chapman* 6 (PERTH), *C. Chapman s.n.*, 1972 (PERTH 00723517), *C. Chapman s.n.*, 20 July 1971 (PERTH 00723509), *R.J. Cumming* 1548 (PERTH) and *B.R. Maslin* 6557 (BRI, CANB, K, MEL, MO, NSW, NY, PERTH).

Distribution. Southwest Western Australia in the northern area of the Darling Botanical District (1:250,000 maps H50-10,14). Seemingly occurs in a very restricted area just north of Mogumber (c. 100 km north of Perth). The one collection recorded from outside this range (*C. Chapman s.n.*, 23 August 1971 (PERTH 00617806)) is possibly erroneously labelled.

Flowering and fruiting periods. Few collections to hand; however, flowers have been recorded from June to August and although mature seed has been collected the specimen was not dated.

Typification. There is a sheet at herb. CGE which has been determined as holotype of *A. platyptera*. It is annotated "*A. platyptera*" by Lindley but there are no collection details given. The two specimens on this sheet are rather depauperate but accord with the description given in the protologue.

Affinities. Vegetatively this variety is rather similar to some forms of var. *tetrantha* in having broad phylloclades with the free portion of the phyllodes drawn out into long, innocuous or scarcely pungent points. Both varieties occur in regions north of Perth but they are not sympatric; var. *platyptera* is readily distinguished from var. *tetrantha* by its golden, 12-15-flowered heads.

Variants. A variant known only from the Tutanning Flora Reserve east of Pingelly (c. 200 km southeast of Mogumber) is not included in the above description and probably represents an undescribed taxon. It keys out closest to var. *platyptera*, however, it differs in its very narrow (2-8 mm wide), glabrous or minutely hirsutellous phylloclades, shorter phyllodes (the free portions being 10-40 mm long), and glabrous, narrower pods (6-7 mm wide). Further study is needed to confirm the status of this entity. Specimens examined are the following: *M.L. Cody s.n.*, PERTH 00617792, *A.S. George* 7781, *K.F. Kenneally* UWA567 and *B.R. Maslin* 6759 (all PERTH)

A northern variant (from near Mingenew) is discussed under var. *biglandulosa* above.

Conservation status. A Priority 1 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

Id. *Acacia alata* var. *tetrantha* Maslin, var. nov.

Frutices 0.3-0.6 m alti et 1.5 m extendentes. *Phyllodia* in ramis non-florentibus 3-10 mm lata sed interdum 15 mm lata, phyllodiorum parte discreta 1-7 cm longa acuminata recta usque ad recurvata apicaliter innocua usque ad vix spinosa et recta vel recurvata usque ad valde uncinata; angulus glandulifer saepe perprominens et normaliter solitarius sed raro 2 vel 3. *Stipulae* innocuae. *Pedunculi* glabri vel hirsutelli usque ad pilosi. *Capitula* tetramera alba, alabastris acutis usque ad subacutis. *Legumina* arcuata usque ad fere recta 7-11 mm lata.

Typus: Hill River crossing on Jurien-Cervantes road, 22 May 1978, *R.J. Cumming* 81 (*holo:* PERTH 00724173).

Shrubs 0.3-0.6 m tall, spreading to 1.5 m across. *Phyllodes* on non-flowering region of stems 3-10 mm wide, occasionally 15 mm; free portion of phyllodes acuminate, 1-7 cm long, straight to recurved, apices innocuous to scarcely spinose and straight or recurved to strongly uncinata; gland-angle often very prominent, normally 1, rarely 2 or 3. *Stipules* innocuous. *Peduncles* glabrous or hirsutellous to shortly pilose. *Heads* 4-flowered, white; flower buds acute to sub-acute. *Pods* curved to almost straight, 7-11 mm wide.

Selected specimens examined. WESTERN AUSTRALIA: 9 km SSE of Encabba, *R.J. Hnatiuk* 770907 (PERTH); Yanchep National Park, *A.M. James* 297 (PERTH); Hill River crossing, c. 10 miles [16 km] due E of Jurien Bay, *B.R. Maslin* 2621 (BRI, CANB, PERTH), 2621A (K, PERTH) and 6570 (CANB, K, MEL, PERTH); Cockleshell Gully crossing on the Jurien-Leeman road, *B.R. Maslin* 6571 (MEL, PERTH) and 6572 (K, MEL, PERTH); Cockleshell Gully, *R. Pullen* 9684 (PERTH, also CANB but *n.v.*); Mount Lesueur, *N.H. Speck* UWA561 (PERTH).

Distribution. Southwest Western Australia in the Darling Botanical District and southern area of the Irwin Botanical District (1:250,000 maps H50-5,9,14). Disjunct, occurring from Eneabba (c. 130 km north of Lancelin) south to Cervantes (c. 60 km northwest of Lancelin), also at Yanchep (c. 130 km south of Cervantes).

Habitat. Usually grows near watercourses on sand and sandy clay in eucalypt low open forest and woodland, also in Mallee and Paperbark (*Melaleuca* sp.) communities.

Flowering and fruiting periods. Flowers from April to July; in the other varieties flowering commences in June. Pods with mature seeds have been collected in November.

Affinities. The 4-flowered heads distinguish var. *tetrantha* from the other varieties of *A. alata* except var. *biglandulosa* which is readily recognized by the free portion of its phyllodes being shorter and possessing rigid, spinose tips. The flower buds on the new variety are acute to sub-acute (at least when seen dry) whereas in the other varieties they are obtuse or obtuse-apiculate. Vegetatively var. *tetrantha* it is similar to var. *platyptera*.

Variation. There appears to be clinal variation in the morphology of the free portion of phyllodes. Around Yanchep (the southern end of the geographic range) the free portion of the phyllodes are long, narrow, clearly recurved and have distinctly uncinat apices; around Eneabba (the northern end of the geographic range) they are shorter, broader and commonly straight. Most collections are from the Hill River district in the middle of the geographic range; the phyllodes here appear to be intermediate in form.

Conservation status. Not known to be under threat.

Etymology. From the Greek *tetra* - four, and *anthos* - flower, an allusion to the consistently 4-flowered heads.

2. *Acacia applanata* Maslin, sp. nov.

Suffrutices graminiformes 10-40 cm alti erecti vel aliquando decumbentes e basi pauci- vel multi-ramosi, ramis infirmis et plus minusve prostratis, aliquando per sarmentis extendentes. Phyllodia pauca cum ramulis continua, bifarie decurrentia alas oppositas formantes, utraque ala ad alam infra extendente, alis plerumque 0.5-3 mm latis, glabris vel pubescentibus vel hirsutis vel scabridulis et atro-viridibus; phyllodiorum pars discreta plerumque 1.5-5 mm longa, inflorescentias subtendentes vulgo dentiformia, acuta, nervo ad marginem adaxialem apposito. Glans nulla. Stipulae minutae. Racemi 0.5-10 mm longi 1-4 capitulis, axibus gracilibus, capitula globularia aurea 10-20-floribus, alabastris obtusis usque ad subacutis. Flores pentameri, calyce gamosepalo. Legumina stipitata usque 3 cm longa et 7-8 mm lata, tenuiter crustacea, arcuata, plana, villosa, seminibus transversalibus oblongis usque ad ellipticis, 3-4 mm longis, arillatis.

Typus: E side of Luyer Avenue, 75 m from junction with Station Street, East Cannington, Western Australia, 9 September 1992, R.S. & M.N.S. Cowan RSC A877 (*holo:* PERTH 02433699; *iso:* AD, CANB, K, G, MEL, MO, NSW, NY, PERTH 02568969).

A. diptera Lindl., Edwards' Bot. Reg. Sketch Veg. Swan R. xv (1839), *pro parte*, not as to lectotype, as to Vasse River, Mrs. Molloy paralectotypes at CGE and K (see discussion under *A. willdenowiana* below).

A. diptera var. *angustior* Meisn. in Lehm., Pl. Preiss. 1: 5 (1844); *A. benthamii* var. *angustior* (Meisn.) Heynh., Nom. Bot. Hort. 2: 2 (1846). *Lectotype* (fide Maslin and Cowan, 1994): In glareosis ad jugum montium Darlingsrange, haud procul a catarrhacta [i.e. Susannah Brook], 3 August 1839, legit. L. Preiss 993 (sphalm. "393" in protologue) (NY); *isolecto*: HBG, K, FI, G, GOET, L, LD, P, STR. *Paralectotype 1*: In asperis ad latus occidentale montis "Wuljenup" [i.e. Willyung Hill, near Albany], Western Australia, 14 October 1840, legit. L. Preiss 994 (sphalm. "394" in protologue) (G, LD, NY). *Paralectotype 2*: In arenosis subumbrosis silvae ad fluvium Cygnorum [Swan River] hinc inde, Western Australia, 23 July 1839, legit. L. Preiss s.n. (LD).

?*A. diptera* var. *eriocarpa* W. Fitzg., J. W. Austral. Nat. Hist. Soc. 1: 44 (1904). *Typus*: None cited; *n.v.*

Grass-like *sub-shrubs* 10-40 cm tall, erect or sometimes sprawling with weak, \pm prostrate stems, few- or multi-stemmed from the base, sometimes spreading by subterranean runners. *Stipules* minute. *Phyllodes* few, continuous, bifariously decurrent and forming opposite wings with each one extending to the next below, the wings usually 0.5-3 mm wide, sometimes 5-7 mm, glabrous, pubescent, hirsute or scabridulous and dark green; *free portion of phyllodes* 1.5-5 mm long, sometimes to 10 mm at base of stems, commonly tooth-like where subtending inflorescences, acute, main nerve near upper margin and often not prominent. *Gland* absent. *Racemes* 0.5-10 mm long with 1-4 heads; *raceme axes* slender and terete, rarely a few narrowly winged as in *A. willdenowiana*. *Peduncles* solitary or rarely the distal pair twinned, 5-12 mm long, slender, glabrous. *Heads* globular, golden, 10-20-flowered; *flower buds* obtuse to sub-acute. *Flowers* 5-merous. *Calyx* gamosepalous, 1/3-2/5 length of corolla, shortly divided, lobes triangular. *Petals* nerveless or very obscurely 1-nerved. *Pods* stipitate, to 3 cm long, 7-8 mm wide, thinly crustaceous, curved, flat, raised over seeds, villous, margins thickened. Seeds transverse in pods, oblong to elliptic, 3-4 mm long, dark brown; *plcurogram* continuous; aril once-folded below seed.

Selected specimens examined. WESTERN AUSTRALIA: Boonanarring Brook near Gingin, J.J. Alford 161 (PERTH); Albany, 9 miles [14.5 km] along Lower King Road from Emu Point turn-off, E.M. Bennett 1113 (PERTH); Jurien Bay Road, W.E. Blackall 3671 (PERTH); 38.3 miles [61.5 km] from Collie towards Williams, E.M. Canning WA/68 3790; Luyer Avenue between Station Street and Beckman Close, East Cannington, R.S. Cowan A.865 (PERTH); Darling Range, southern foot of Mount Cooke, M.G. Corrick 8362 (PERTH); Mount Barker hill, N. Hoyle 1046 (PERTH); "Caladenia Hill" farm, corner of Knight and Washpool roads, Woogenilup, c. 30 km ENE of Mount Barker, 30 September 1984, P. Luscombe s.n. (PERTH 00717401); 0.6 km W of Bussell Highway on Ruabon Road, between Bunbury and Busselton, B.R. Maslin 2812 (PERTH); c. 3.5 km due ENE of Bullsbrook East, B.R. Maslin 5583 (BRI, MEL, NSW, PERTH); Kent Road, 0.1 km S of Crawler Road, 25 km due SW of York, B.R. Maslin 6183 (CANB, G, PERTH); Great Northern Highway at intersection of North Road (between Bindoon and New Norcia), B.R. Maslin 6551 (CANB, K, MEL, NSW, PERTH); 20 km N of Dandaragan on Badgingarra Road, B.R. Maslin 6559 (NSW, PERTH); Yanchep National Park, 0.4 km N of Park Entrance on road to Lancelin, B.R. Maslin 6564 (B, NSW, PERTH); Bayswater, 10 July 1900, A. Morrison s.n. (PERTH 00723185); Cannington, 29 July 1909, A. Morrison s.n. (PERTH 00723193); Lower Helena Valley, J. Seabrook 52 (CANB, PERTH); 24 miles [38.5 km] S of Fremantle on Mandurah road, 1 mile [1.6 km] E on Serpentine road, C.L. Wilson 818 (PERTH).

Distribution. Southwest Western Australia occurring principally in the Darling Botanical District, but also adjacent Irwin, Avon and Eyre Botanical Districts (1:250,000 maps H50-9,10,14; 150-2,5,6,11,15). Sporadic from near Jurien (c. 80 km northwest of Lancelin) south to Albany. As

with *A. willdenowiana* many of the habitats of *A. applanata* around the Perth metropolitan area have probably been destroyed through urban development.

Habitat. Grows mostly in sand, loam and lateritic soils, often in winter wet depressions, usually in open woodland, woodland and forest or occasionally in shrubland.

Flowering and fruiting periods. Flowers have been recorded from June to October, however the main flush occurs in August and September. A single collection with mature fruit was collected in November.

Typification. A type was not cited by Fitzgerald (1904) when he described *A. diptera* var. *eriocarpa* and I have seen no original material of this entity. While it is probable that this name is referable to *A. applanata* it is curious that Fitzgerald described the flowers as 4-merous.

Variation. Plants from the Bindoon (c. 20 km east of Gingin) to Jurien area are multi-stemmed at the base whereas elsewhere they are usually single-stemmed or few-branched at ground level. Compared with populations occurring further south these northern plants also tend to have a greater proportion of phyllodes exceeding 3 mm wide (they reach 5-7 mm) and with free portions greater than 5 mm long (sometimes reaching 10 mm at base of stems).

Affinities. Until now this species was included under *A. willdenowiana* with which it is closely related and sometimes sympatric or parapatric (see *A. willdenowiana* for discussion). Vegetatively resembling the very rare *A. anomala* C.A. Gardner ex Court but readily distinguished by its globular heads and its short, broad, curved pods with transverse seeds; the two species are sympatric near Bullsbrook East. *Acacia anomala* is fully described and illustrated in Court (1978).

Hybrids. Judging from herbarium material it appears that this species hybridizes with *A. alata* R. Br. var. *alata* in the Darling Range near Perth. Two such records exist, i.e. *R.J. Cumming* 1090 (PERTH) and *R. & M. Hamilton* 125 (PERTH). Label details for *Cumming* 1090 show that both *A. alata* and "*A. willdenowiana*" (I presume that this was a misidentification for *A. applanata*) were common in the area but only two plants of the putative hybrid were seen.

Conservation status. Widespread, not considered rare or endangered.

Common name. Grass Wattle.

Etymology. From Latin *applanatus*, flattened or horizontally spreading, referring to the winged stems.

3. *Acacia bifaria* Maslin, sp. nov.

Frutices prostrati vel semiprostrati ad 0.5 m alti et 2 m expansi, ramulis leviter ad manifeste flexuosis glabris. *Phyllodia* cum ramulis continua, bifarie decurrentia et alas oppositas formantes, utraque ala ad alam infra extendente, alis 1-3.5 longis et 4-10 mm latis, coriaceis glabris praeter axillas dense et minute pilosas resinosas, viridibus usque ad subglaucis, ad marginem interdum undulatis; phyllodiorum pars discreta 5-15 mm longa, marginem adaxialem manifeste rotundatum, excentrice mucronatum, nervo principali plus minusve obscuro vel ut videtur destituto. *Glans* non prominens. *Stipulae* persistentes. *Racemi* valde reducti monocephali 0.5-1.5 mm longi, *pedunculis* 2-12 mm

longis glabris, aliquando fructu descendente, *capitula* globularia dilute aurea 16-23-floribus. *Sepala* plus minusve discreta; *petala* enervia. *Legumina* valde curvata usque ad bispitalia, plus minusve teretia usque ad 2 cm longa et 2-3 mm lata, tenuiter crustacea plus minusve glabra nigra. *Semina* longitudinalia oblonga, circa 3 mm longa arillo terminali et conico.

Typus: near intersection of Old Newdegate Road and Floater Road, c. 2 km north of Ravensthorpe, Western Australia, 30 August 1980, B.R. Maslin 4771 (*holo*: PERTH 00713082; *iso*: CANB, K, NY, PERTH 00713074).

Prostrate or semi-prostrate, commonly domed *shrubs* to 0.5 m tall and 2 m across. *Branchlets* slightly to prominently flexuose, glabrous, light brown to red. *New shoots* reddish. *Stipules* persistent, triangular to narrowly triangular or oblong-triangular, 1-5 mm long. *Phyllodes* continuous with branchlets, bifariously decurrent and forming opposite wings with each one extending to the next below, 1-3.5 cm long (measured along outer margin from mucro to point of attachment to branchlet), 4-10 mm wide, coriaceous, glabrous except axils invested with dense, minute, red-brown resin-hairs (sometimes intermixed with white, non-resinous, appressed hairs), green to sub-glaucous, flat or occasionally undulate along margins, marginal nerve reddish but aging yellow; *free portion of phyllodes* 5-15 mm long, 4-10 mm wide, adaxial margin obviously rounded, excentrically mucronate, main nerve \pm obscure or superficially absent. *Gland* not prominent, situated near or below middle of the rounded upper margin, c. 0.5 mm long. *Inflorescences* extremely reduced 1-headed racemes, 1-4 per axil; *raceme axes* 0.5-1.5 mm long, sometimes growing out at anthesis, glabrous except for minute resin hairs which rim the base of the peduncle. *Peduncles* 2-12 mm long, glabrous, straight and \pm erect except sometimes strongly recurved from the base when in fruit; receptacle glabrous to sub-glabrous; *basal peduncular bracts* solitary, caducous or persistent, 1-2 mm long, dark brown. *Heads* globular, light golden, 16-23-flowered. *Bracteoles* absent. *Flowers* 5-merous; *sepals* 1/3-1/2 length of petals, joined at extreme base, oblong to narrowly oblong, sparsely puberulous, slightly thickened adaxially at apex; *petals* 1.5 mm long, glabrous, nerveless. *Pods* strongly curved to twice-coiled, \pm terete, slightly constricted between seeds along the inner edge, to 2 cm long, 2-3 mm wide, thinly crustaceous, finely longitudinally rugulose, resinous (but not viscid) when very young, glabrous or sparsely strigulose, black, marginal nerves light brown and not thickened. *Seeds* longitudinal with aril facing apex of pod, oblong, c. 3 mm long and 1.5 mm wide, dark brown, dull; pleurogram very fine, oblong, open at hilar end; areole c. 1 mm long and 0.5 mm wide; *funicle* filiform, c. 1 mm long, abruptly expanded into a conical, terminal, yellow-brown (when dry) aril c. 1 mm long.

Selected specimens examined. WESTERN AUSTRALIA: Ravensthorpe, C. Davies 116 (PERTH); E side of Fitzgerald River, Ongerup-Ravensthorpe road, 4 September 1976, A.S. George s.n. (PERTH 00712094); 9 miles [14.4 km] NW of Ravensthorpe, J. Goodwin 229(3950) (PERTH); Fitzgerald River crossing on Jerramungup-Ravensthorpe road, B.R. Maslin 802 (AD, CANB, K, MEL, MO, NSW, PERTH); 2.5 km S of Ravensthorpe towards Hopetoun, B.R. Maslin 2559 (PERTH); c. 7 km from Ravensthorpe towards Lake King, B.R. Maslin 2577 (AD, B, BRI, MEL, PERTH); 10 km W of Ravensthorpe, K.R. Newbey 8052 (PERTH); c. 20 miles [32 km] W of Ravensthorpe, S. Paust 700 (PERTH); rest area on road to Lake King, 4 miles (6.4 km) NW of N.R.1 and NW of Ravensthorpe, T. & J. Whaite 4306 (PERTH, also CANB, K, NSW but n.v.).

Distribution. Southern Western Australia occurring in the Eyre Botanical District (1:250,000 maps I50-8,12; I51-5). Occurs from Ravensthorpe west-southwest to the Fitzgerald River (c. 30 km east of Jerramungup).

Habitat. Grows on clay, loam and sand in scrub, Mallee communities and woodland.

Flowering and fruiting periods. Flowering specimens have been collected from August to October and in December. Pods with mature seed have been collected in December.

Variation. The phyllodes on some specimens from around Ravensthorpe are occasionally undulate (e.g. *R.J. Cumming* 1072; *C. Davies* 117; *B. Barnsley* 500, all PERTH). A similar looking undulate phyllode variant occurs in *A. glaucoptera* near Bremer Bay (c. 110 km southwest of Ravensthorpe).

Affinities. Closely related to *A. glaucoptera* but *A. bifaria* is most readily distinguished by its green to sub-glaucous phyllodes and 16-23-flowered heads. Other characters useful in discriminating the new species include the following. The phyllode axils of the new species are densely resin-haired, the hairs are red-brown and minute (best observed at x10 mag., these hairs are sometimes intermixed with short, appressed non-resinous hairs) whereas in *A. glaucoptera* the phyllode axils are densely tomentulose by a tuft of white, erect, non-resinous hairs that are usually visible to the unaided eye. In *A. bifaria* the free portion of the phyllode is generally shorter and narrower than in *A. glaucoptera* and its upper margin is distinctly rounded and ends in an excentric mucro (while *A. glaucoptera* sometimes has similar phyllodes, they are more commonly narrowed to an elongated, acute or shortly acuminate, \pm centric point). The pods of *A. bifaria* often only strongly curved, and in the less common coiled condition they are not twisted as in *A. glaucoptera*. Furthermore, there appears to be habit differences between the two species: *A. bifaria* is a prostrate or semi-prostrate, commonly domed plant to c. 0.5 m tall and although *A. glaucoptera* may also have this habit it commonly grows to a taller shrub (reaching 1.5 m) with a discrete, single trunk and a somewhat open growth form with rather gangly branches. *Acacia bifaria* has a more restricted distribution than *A. glaucoptera* and although both are common around Ravensthorpe it is not known if they are ever sympatric.

The inflorescence and pod characters suggest that *A. bifaria* and *A. glaucoptera* are related to *A. excentrica* Maiden & Blakely and the *A. merrallii* F. Muell. and its allies; however, these relatives do not have bifarious, decurrent phyllodes which form prominent wings along the branchlets.

Conservation status. A Priority 3 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

Etymology. The epithet is derived from the Latin *bi-*, two and *-farius*, a multiplication in numbers of parts. It alludes to the phyllocladinous branchlets where the phyllodes are in two ranks on opposite sides of the branchlet axis.

4. *Acacia glaucoptera* Benth., *Linnaea* 26: 604 (1855)

Lectotype (here selected): Swan River, Western Australia, *J. Drummond* 5: 1 (K, sheet stamped "Herbarium Benthonianum 1854", see discussion below; *isolecto*: BM, CGE - sheet labelled "Swan River to Cape Riche", K - sheet stamped "Herbarium Hookerianum 1867"). *?Paralectotype*: on clayey flats near the Gardner and Salt R., Western Australia, *G. Maxwell* (BM).

?A. sinuata Hort. ex Jacques, *J. Soc. Imp. Centr. Hort.* 6: 672 (1860), non (Lour.) Merrill (1935). *Typus*: cultivated in May 1860 in Paris by *Mr Rougier-Chauviere*; *n.v.*

[*A. bossiaeoides* auct. non A. Cunn. ex Benth.: B. Seemann, *Eur. Acac.* 7 tab. 1 (1852).]

Illustrations. B. Seemann, *loc. cit.*; R. Erickson *et al.*, *Flowers Pl. W. Australia* 2nd edn 94 (1979); M. Simmons, *Acacias of Australia* 1: 17 (1981).

Prostrate or semi-prostrate, mid-dense to moderately open *shrubs* to c. 1.5 m across, also growing single-stemmed and erect to 1.5 m tall, branches often somewhat gangling. *Branchlets* straight to slightly flexuose, glabrous. *New shoots* red. *Stipules* deciduous or persistent, triangular or oblong-triangular, 1-3 mm long. *Phyllodes* continuous with branchlets, bifariouly decurrent and forming opposite wings with each one extending to the next below, usually 2.5-7 cm long (measured along outer margin from apex to point of attachment to branchlet) and 0.6-2 cm wide, coriaceous, glabrous except axils densely tomentulous, glaucous, occasionally undulate, main nerve evident, marginal nerve reddish but aging yellow; *free portion of phyllodes* usually 1-4 cm long and acute to shortly acuminate. *Gland* not prominent, situated near or below middle of the upper margin, 0.5-1 mm long. *Inflorescences* extremely reduced 1-headed racemes, 1-2 per axil; *raceme axes* to 0.5 mm long, glabrous; *peduncles* 3-18 mm long, glabrous, \pm erect except often strongly recurved from the base when in fruit so that the peduncle is patent or descending; *receptacle* sub-glabrous or tomentulous; *heads* globular, golden, 30-80-flowered. *Flowers* 5-merous; *sepals* c. 1/2 length of petals, free or joined at base, narrowly oblong to narrowly oblong-oblancoate, sparsely puberulous; *petals* 2 mm long, glabrous, nerveless. *Pods* somewhat irregularly coiled and twisted, sub-terete to compressed, slightly constricted between seeds along the inner edge, to 2 cm long, 2-3 mm wide, thinly crustaceous, smooth or finely longitudinally rugulose, glabrous, black. *Seeds* longitudinal with aril facing apex of pod, \pm oblong, 2.5-3.5 mm long, 2 mm wide, dark brown, dull; pleurogram very fine, open at hilar end; areole 1-1.5 mm long, 0.5 mm wide; *funicle* filiform, c. 1 mm long, abruptly expanded into a \pm conical, terminal, yellow-brown (when dry) aril c. 1 mm long.

Selected specimens examined. WESTERN AUSTRALIA: Dunn Rock Nature Reserve, K.J. Atkins 108408 (PERTH); Swan River, J. Drummond 1 (BM, CGE, G, FI, OXF, P, TCD); Little White Lake Nature Reserve No. 26786 [Carmody Nature Reserve, 25 km SE of Narrogin], G. Durrell *s.n.* (PERTH 00870617); between Hamersley River and East Mount Barren, B.R. Maslin 810 (MEL, PERTH); 4 km NNE of Hawes Hill, Cape Arid National Park, c. 98 km E of Esperance, K.R. Newbey 7889 (PERTH); 45 km W of Grass Patch, K.R. Newbey 8114 (PERTH); 17 km W of Israelite Bay Telegraph Station towards Mount Ragged, R.A. Saffrey 1356 (CANB, K, PERTH); c. 5 km NE of Ravensthorpe towards Esperance, M.D. Tindale 3805 (PERTH, also BRI, CANB, K, L, MEL, US, but *n.v.*); 40 km ESE of Lake King township near No. 1 Vermin Proof Fence, P.G. Wilson 6875 (CANB, K, L, NT, PERTH, SP).

Distribution. Southern Western Australia occurring principally in the Eyre Botanical District, but also adjacent Avon, Darling and Roe Botanical Districts (1:250,000 maps I50-7,8,11,12; I51-5,6,7). Occurs from near Narrogin south to near Manypeaks (c. 35 km northeast of Albany) and east to Israelite Bay (c. 180 km east of Ravensthorpe).

Habitat. Grows in clay and gravelly soils in woodland, tall shrubland and Mallee communities.

Flowering and fruiting periods. Flowers have been recorded from August to December, however the main flush occurs from August to October. Pods with mature seeds have been collected in November and December.

Typification. When Bentham (1855) originally described *A. glaucoptera* he did not cite any specimens, however, in "Flora Australiensis" he listed a number of collections under this name, namely, "Towards Cape Riche, Drummond, 5th Coll. n. 1, and in leaf only, 4th Coll. n. 1; Clay flats,

Fitzgerald, Gardner and Phillips ranges, *Maxwell*." (Bentham 1864: 320). At herb. K there are four sheets determined as *A. glaucoptera* by Bentham; these support either sterile material of *Drummond* 4: 1 (specimens with broad phyllodes) and/or flowering material of *Drummond* 5: 1 (specimens with narrow phyllodes). There is no direct evidence that Bentham actually used this material to prepare the original description of *A. glaucoptera*, however, the *Drummond* 5: 1 specimens accord quite well with the (rather brief) protologue as to stipule, phyllode and flower characters. Therefore, the Kew specimen of *Drummond* 5: 1 on the sheet stamped "Herbarium Benthamianum 1854" has been selected as the lectotype; there is a duplicate of this collection on a sheet stamped "Herbarium Hookerianum 1867" at K. The *Drummond* 4: 1 collection is not regarded as a *type* because it is without stipules and flowers (these were described in the original description). Although there are duplicates of both *Drummond* gatherings at herb. BM and CGE no record was made of the handwriting on these, therefore, I am not sure if they have been seen by Bentham. The CGE specimen of *Drummond* 5: 1 is labelled "Swan River to Cape Riche" which accords with the designation given by Bentham (1864: 320). I have seen a *Maxwell* specimen at herb. BM which is annotated "on clayey flats near the Gardner and Salt River". This is probably the gathering cited by Bentham (*loc. cit.*) under *A. glaucoptera*, however, I did not record the morphological characteristics of this specimen or whether Bentham actually annotated the sheet; this specimen is here regarded as a probable paralectotype of *A. glaucoptera*.

Synonymy. Judging from Jacques' original description of *A. sinuata* it appears as though this name is synonymous with *A. glaucoptera*. Between 1837 and 1863 Jacques published a number of new names referable to Australian taxa of *Acacia*, based on plants cultivated in Paris. However, I have been unsuccessful in locating the types of any of these names, despite having searched for them at herb. P.

Variation. Specimens from the western extremity of the range (Pingrup, Broomehill, Borden, Ongerup, Manypeaks areas) differ from those elsewhere in having smaller phyllodes (1.5-3 cm long; free portion of phyllodes 5-15 mm long and (3)4-6 mm wide). The phyllodes appear to be glaucous (colour determined from herbarium specimens) and have obviously tomentulose axils, the free portion of the phyllodes is usually acute but in some specimens (from Ongerup and Pingrup) it is rounded and excentrically mucronate as in *A. bifaria*. Field and laboratory studies are needed to assess the status of these western populations. Typical *A. glaucoptera* occurs along the south coast from Bremer Bay east to Israelite Bay but there are a few records from inland localities, e.g. near Lake King, Narrogin and the Stirling Range; it also occurs at Broomehill (same locality as the variant). Selected specimens examined: 95 mile peg, Borden - Pingrup road [c. 32 km N of Borden towards Pingrup], A.M. Ashby 4316 (PERTH); 6 miles [9.6 km] SE of Broomehill, K. Newbey 3586 (CANB, K, MEL, NY, PERTH); 1 mile [1.6 km] N of Ongerup, K.R. Newbey 462 (PERTH); c. 20 miles [32 km] NE of Albany towards Jerramungup, S. Paust 507 (PERTH); 34 km SE of Ongerup, N. Stevens KRN9514 (MELU, PERTH) and KRN9514-1 (MELU, PERTH); 2 km S of Borden along Chester Pass Road, J. Taylor and P. Ollerenshaw JT 1870 (PERTH, also CBG, NSW but *n.v.*).

A seemingly rare but distinctive variant with very undulate phyllodes is recorded from north of Bremer Bay (Bremer Bay is c. 65 km southeast of Jerramungup). Specimens examined. WESTERN AUSTRALIA: Swamp Road, N of Bremer Bay, September 1958, J.M. Laws *s.n.* (PERTH 00713139 & PERTH 00713120); road between Bremer Bay Road and Gairdner River, S. Paust 653 (MO, PERTH).

Affinities. Closely related to *A. bifaria* (see this species for discussion).

Conservation status. Widespread, not considered rare or endangered.

Common names. Clay wattle; Flat wattle.

5. *Acacia pterocaulon* Maslin, sp. nov.

Frutex multiramosus erectus vel decumbens ad 1.3 m altus, ramulis glabris. *Phyllodia* cum ramulis continua, bifarie decurrentia alas oppositas formantes, utraque ala ad alam infra extendente, alis 2-6 mm latis coriaceis glabris subglaucis, nervo marginali prominenti, phyllodiorum pars discreta 1-5.5 mm longa lanceolata usque ad triangularis erecta recta vel pervadose incurva, nervo principali centrali. *Glans* basalis. *Racemi* 1-10 cm longi, axibus normaliter sub anthesi angusto-alatis; *pedunculi* 10-15 mm longi, glabri, *capitulis* globularibus, 10-15 mm diametro (sub anthesi sicco) confertim 60-70-floribus aureis. *Flores* pentameri, sepalis plus minusve discretis lineari-spathulatis. *Legumina* linearia ad 12 cm longa et 4-5 mm lata, coriaceo-crustacea glabra, plus minusve pruinosa. *Semina* longitudinalia oblonga 4.5-5 mm longa, arillo subconico.

Typus: W of Morawa [precise locality withheld for conservation reasons], Western Australia, 1 September 1976, B.R. Maslin 4273 (*holo:* PERTH 00719978; *iso:* CANB, K, MEL, NY).

Much-branched, intricate, erect or sprawling *shrubs* to 1.3 m tall, occasionally 2 m; *terminal branches* sparingly divided and often gangling, shallowly sinuous to slightly flexuose, glabrous, furnished with a fine yellow medial nerve. *Stipules* often caducous, 1-2 mm long. *Phyllodes* continuous with branchlets, bifariouly decurrent and forming opposite wings with each one extending to the next below, the wings 2-6 mm wide, coriaceous, glabrous, sub-glaucous, marginal nerves prominent and yellow or light brown; *free portion of phyllodes* 1-5.5 cm long, shortest on inflorescence-bearing portion of branches, lanceolate to narrowly triangular, erect, straight or very shallowly incurved, acute, main nerve central, lateral nerves absent or very obscure. *Gland* not prominent, situated on upper margin of free portion of phyllode near the base, oblong-elliptic, 0.5-1 mm long. *Racemes* 1-8(10) cm long, usually branch-like at anthesis by axes becoming narrowly winged through the development of decurrent phyllodes, 1 or 2 per axil; *raceme axes* glabrous, with 2, small, semi-persistent, alternate, supra-basal bracts. *Peduncles* 10-15 mm long, alternate, usually to c. 5 per raceme; *basal peduncular bracts* caducous. *Heads* globular, densely 60-70-flowered, golden, 10-15 mm diam. at anthesis (dry). *Bracteoles* resembling the sepals. *Flowers* 5-merous. *Sepals* 2/3 length of petals, \pm free, linear-spathulate, fimbriolate apically otherwise \pm glabrous. *Petals* 3-3.5 mm long, glabrous, midrib obscure. *Pods* linear, to 12 cm long, 4-5 mm wide, coriaceous-crustaceous, pendulous, straight to very slightly curved, slightly raised over seeds and not or scarcely constricted between them, glabrous, purplish brown and pruinose or faintly pruinose, margins not thick. *Seeds* longitudinal with aril facing apex of pod, oblong, obliquely truncate on margin adjacent to aril, 4.5-5 mm long, 3 mm wide, dark brown to black, \pm shiny; *pleurogram* obscure with narrow opening at hilar end; *areole* 1.5-2 mm long, c. 0.5 mm wide; *funicle* minute, abruptly expanded into the aril; *aril* sub-conical, oblique at end of seed, white (drying yellow), dull greyish green at hilum (drying brownish).

Other specimens examined. WESTERN AUSTRALIA: type locality, A.M. Ashby 4884 (PERTH, also AD but n.v.) and 5202 (PERTH), R.J. Cranfield & P.J. Spencer 7855 (PERTH), R.J. Cumming 1655 (PERTH), 2194 (MELU, NSW, PERTH), B.R. Maslin s.n. (PERTH 00719943) and 6597 (PERTH), K. Newbey 2126 (PERTH), Morawa School 1 (PERTH).

Distribution. Southwest Western Australia occurring in the northern area of the Avon Botanical District (1:250,000 map H50-6). Seemingly restricted to a small area within a range of hills west of Morawa. Further survey is needed to determine the frequency and geographic range of the species; it is currently known that several hundred plants exist.

Habitat. Grows in rocky (chert) clay-loam on slopes of hills in *Eucalyptus* woodland or dense casuarina scrub.

Flowering and fruiting periods. Flowers in August and September. Pods with mature seeds have been collected in late November.

Affinities. The precise affinities of *A. pterocaulon* are not altogether clear. Although its vegetative characters resemble those of the more southerly distributed *A. glaucoptera* and *A. willdenowiana*, the new species is readily distinguished by its long, linear, \pm straight pods. *Acacia glaucoptera* has a similar habit to *A. pterocaulon* but has much smaller heads (5-6 mm diam. at anthesis when dry even though the number of flowers is 30-80 per head), much shorter racemes and is densely tomentulous in the axils of its phyllodes. Although *A. willdenowiana* often has long, branch-like racemes and heads that can reach c. 10 mm when dry, it differs significantly from *A. pterocaulon* in its rush-like growth habit, twinned peduncles, pale yellow to white heads with 13-21 flowers, gamosepalous calyx and transverse seeds.

Conservation status. A Priority 1 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

Etymology. From the Greek, *pteron* - winged, and *kaulos* - stem, an allusion to the prominently winged branches.

6. *Acacia willdenowiana* H.L. Wendl., Verz. Berggart. Hannover 5 (1845)

Typus: Based on the following.

A. diptera Lindl., Sketch Veg. Swan R. xv (1839), non Humb. & Bonpl. ex Willd. (1809); *A. benthamii* Heynh. (as "*benthami*"), Nom. Bot. Hort. 2: 2 (1846), non Meisn. (1844). *Lectotype* (here selected, see discussion below): Swan River, Western Australia, 1839, *J. Drummond s.n.* (CGE; *isolecto*: CGE, K; *?isolecto*: CGE, K, see discussion below). *Paralectotypes:* see *A. applanata* above.

A. diptera var. *eriotptera* Graham, Bot. Mag. 68: t. 3939 (before May 1842), non Bentham (about June 1842). *Typus:* Cultivated plant received in 1840 at Royal Botanic Gardens, Edinburgh, from Glasgow, where it was raised from Swan River seeds sent by *J. Drummond*; *n.v.*, see note below.

A. diptera var. *eriotptera* Benth., London J. Bot. 1: 325 (about June 1842), *nom. illeg.* (later homonym). *Syntype* 1. Swan River, Western Australia, *J. Drummond* 182 (K). *Syntype* 2. Swan River, Western Australia, *J. Drummond s.n.* (K).

A. diptera var. *latior* Meisn. in J.G.C. Lehmann, Pl. Preiss. 1: 4 (1844); *A. benthamii* var. *latior* (Meisn.) Heynh. (as '*Benthami*'), Nom. Bot. Hort. 2: 2 (1846). *Lectotype* (see Maslin and Cowan 1994): near Halfwayhouse [Halfway House, 31° 54'S, 116° 20'E], Western Australia, 12 September

1839, *L. Preiss* 996 (NY; *isolecto*: G, GOET, HBG, L, LD, STR). *Paralectotype*: near Perth, Western Australia, 8 May 1839, *L. Preiss* 995 (B, FI, G, GOET, HBG, K, L, LD, NY - sphalm. "595", P, STR).

Illustrations. W.J. Hooker, *Icon. Pl. ser. 1*, 4: t. 369 (1841); R. Graham, *loc. cit.*; M. Simmons, *Acac. Australia* 2: 11, pl. 36 (1988).

Erect *shrubs* 30-60 tall, sometimes to 1 m tall or stems scrambling, few- or multi-stemmed from the base. *Stipules* minute. *Phyllodes* continuous with branchlets, bifariouly decurrent forming opposite wings with each one extending to the next below, the wings variable in width but commonly 1-5 mm wide, sometimes to 15 mm, glabrous, rarely pilose, pubescent or puberulous, grey-green to glaucous; *free portion of phyllodes* 5-20(50) mm long, acute, nerve close to upper margin and usually not prominent. *Gland* absent. *Racemes* 2-11 cm long, commonly patent and 2 per axil; *raceme axes* normally very narrowly winged (through development of decurrent phyllodes) at antheses, if wings expand the peduncles appear simple and axillary. *Peduncles* 6-15 mm long, twinned, slender, glabrous. *Heads* globular, 10-12 mm diam. (fresh), white to cream, sometimes pale lemon yellow, 13-21-flowered; *flower buds* normally acute to sub-acute (when dry). *Flowers* 5-merous. *Calyx* gamosepalous, 1/5-1/3 length of petals, shortly lobed, lobes triangular. *Petals* nerveless or very obscurely 1-nerved. *Pods* to 6 cm long, 10-15 mm wide, thinly crustaceous, curved, flat, raised over seeds, often lightly pruinose, glabrous, rarely pilose on the thick margins. *Seeds* transverse in the pods, \pm oblong, 5-6 mm long, dark brown, arillate.

Selected specimens examined. WESTERN AUSTRALIA: Boonanarring Brook near Gingin, J.J. Alford 391 (PERTH); Subiaco, May 1901, *C. Andrews s.n.* (PERTH 00723118); Bibra Lake, W.M. Carne, 16 June 1923 (PERTH 00725145); c. 40 miles [c. 64 km] SW of Winchester on Coorow-Green Head road, 12 June 1974, *C. Chapman s.n.* (CANB, K, MEL, NSW, NY, PERTH 00720011); 4.8 km W of Great Northern Highway along North road, 15 km SW of New Norcia, R.J. Cranfield 4263 (PERTH); Leederville, June 1897, *Col. Goadby s.n.* (PERTH 00725110); Stirling Range, T. Hales for A.M. Ashby 4592 (PERTH); Cottesloe, 22 July 1897, *R. Helms* (PERTH 00718416); "Caladenia Hill" farm, corner of Knight and Washpool roads, Woogenilup, c. 30 km ENE of Mount Barker, 25 May 1983, *P. Luscombe s.n.* (K. PERTH 00717428); 16 km W of Harvey, B.R. Maslin 443 (MEL, PERTH); Kent Road, 0.1 km S of Crawler Road, 25 km due SW of York, B.R. Maslin 6183 (CANB, G, NY, PERTH); 12 km due E of The Lakes roadhouse, Inkpen Road 0.5 km N of Perth-York road, B.R. Maslin 6525 (PERTH); 24 miles [38.5 km] S of Fremantle on Mandurah road, 1 mile [1.6 km] E on Serpentine road, C.L. Wilson 817 (PERTH).

Distribution. Southwest Western Australia occurring in Irwin and Darling Botanical Districts and adjacent area of the Eyre Botanical district (1:250,000 maps H50-6,9,10,14; 150-2,6,11). Sporadic from near Coorow south to near Stirling Range (Stirling Range is east of Cranbrook). Judging from herbarium records *A. willdenowiana* was formerly common around Perth, however, many of its habitats have been destroyed through urban development.

Habitat. Grows in sand, loam and lateritic soils, often in winter wet depressions, usually in open woodland and woodland.

Flowering and fruiting periods. Flowers have been recorded from May to October, however, the main flush occurs June to September. A single collection with mature fruit was collected in November.

Typification. The type sheet of *A. diptera* at herb. CGE and is annotated by Lindley "Acacia diptera m" and supports a number of elements, not all of which are labelled. The specimens appear to represent

both *A. diptera sensu lectotypico* and *A. applanata* and there are duplicates of most of them at herb. K.

1. Left hand specimen on the CGE sheet is without collecting details; the probable duplicate of this at Kew is also without collecting details. It is likely that these specimens form part of the lectotype gathering of *A. diptera* (see no. 2 below) and are therefore regarded as probable isolectotypes.

2. Central specimens on the CGE sheet are labelled "Swan River, 1839, *Drummond*"; there are duplicates of these at Kew. One of the CGE specimens has been selected as the lectotype of *A. diptera* (originally chosen by A.B. Court, 18 June 1969); the K specimens are regarded as isolectotypes. These specimens accord well with the protologue.

3. Upper right hand specimen on the CGE sheet is labelled "Sandy light soil dry above" (probably in *Mrs G. Molloy's* hand); the Kew duplicate of this is labelled "Vasse River, *Mrs. Molloy*". These specimens appear to be *A. applanata* (but with unusually broad phyllodes, i.e. 3-7 mm wide) and are regarded as paralectotypes of *A. diptera*.

4. Lower right hand specimen on the CGE sheet is labelled "Swan River, *Capt. James Mangles*"; there are no specimens at herb. K which are attributed to Mangles. This specimen may possibly be part of the *Molloy* collection (see no. 3 above), it is *A. applanata* and is regarded as a paralectotype of *A. diptera*.

The type of *A. diptera* var. *erioptera* Graham seems not to be extant, however, there is a specimen at herb. E (a probable duplicate at herb. K) which was probably taken from the type plant. The specimen is annotated by R. Graham "Acacia *diptera* var. *erioptera* Grah. Greenhouse R. Bot. Gard. Edin. 24 Decb. 1842."

Bibliographic note. The name *A. diptera* var. *erioptera* was published separately by both R. Graham and G. Bentham in 1842; the two descriptions were identical. Ascertaining the precise dates of publication for the respective works is difficult, however, it seems probable that Graham's appeared before May 1842 (Chapman 1991) and Bentham's in about June 1842 (Stafleu and Cowan 1979). Additional evidence that Graham's name was published first is seen from Bentham (1864) where var. *erioptera* is attributed to Graham.

Variation. Phyllode width is very variable, e.g. 1-6 mm and 5-13 mm wide respectively on two plants from the population where *B.R. Maslin* 6525 was collected. The free portion of the phyllodes on specimens from the north of the range sometimes reach 50 mm long, elsewhere they are rarely exceed 20 mm. Specimens from the southern end of the range have pale lemon yellow heads, elsewhere they are white to creamy white.

Affinities. Until recently *A. willdenowiana* was commonly called *A. diptera* (Court 1972) and has long been confounded with *A. applanata* (see above). Confusion between these two species occurred because both are low shrubs with winged stems and globular heads, furthermore, they are sometimes sympatric or parapatric. As discussed above even the type collection of *A. diptera* contained elements of both species. Meisner (1844) recognized the differences between the two, describing *A. willdenowiana* as *A. diptera* var. *latior* and *A. applanata* as *A. diptera* var. *angustior*.

Acacia willdenowiana is distinguished from *A. applanata* by inflorescence, vegetative and carpological features. Its racemes are long (2-11 cm) with twinned peduncles and white to pale yellow, larger heads; furthermore, at anthesis the raceme axes are commonly very narrowly winged through the development of decurrent phyllodes which sometimes expand considerably before flowering is finished so that the peduncles appear to be simple and axillary. In *A. applanata* the racemes do not exceed 1 cm in length and the axes are slender and terete (only very rarely winged), the peduncles are singular (except occasionally the distal pair is twinned) and the heads are a rich golden colour. Vegetatively *A. willdenowiana* tends to be a taller, more robust plant than *A. applanata* and has grey-green to glaucous (not green) phyllodes. Also, its phyllodes are only rarely hairy (includes the types of *A. diptera* var. *erioptera* Graham and var. *erioptera* Benth.), are commonly broader and have a longer free portion. The pods and seeds of *A. willdenowiana* are larger than those of *A. applanata*, also, its pods are usually glabrous. Otherwise the carpological features of the two species are very similar except that *A. applanata* is apparently a more shy seeder.

Acacia willdenowiana is also related to *A. alata* (see above).

Common name. Two-winged *Acacia*.

Conservation status. Not known to be under threat.

Aphyllodinous taxa

7. *Acacia aemula* Maslin, sp. nov.

Suffrutex aperto-ramosus juncus 0.2-0.4 m altus, plerumque plus minusve prostratus, ramulis teretibus striatis cum costis prominentibus, laevibus vel muricatis glabris. *Phyllodia* rami simulantem remota quinquangulo-teretia usque ad plus minusve plana et linearia mucronata, pulvino obscuro, 1-11 mm longa, 1-2 mm lata, laevia vel muricata glabra, quinquinerva (in quoque facie uninervata et cum phyllodiis plana margine superiore nervoidea. *Stipulae* 2-3 mm longae. *Glans* non prominens, super basem 1-3 mm disposita. *Pedunculi* 5-15 mm longi saepe reflexi glabri vel appresso-puberuli, *capitulis* globularibus cremeis vel aureis laxae 6-11-floribus. *Flores* tetrameri, alabastris ovatis usque ad ellipticis acutis, *calyce* gamosepalo parvo; *petala* flabellato-striata glabra. *Legumina* 3-6 cm longa, 4-5 mm lata stipitata acuminata, plus minusve tenuiter coriaceo-crustacea, arcuata, acute quadrangularia marginibus alatis circa 2 mm latis, glabra, rubello-brunnea. *Semina* longitudinalia oblonga 4-5 mm longa, arillo terminali et conico.

Typus: Rawlinson Road, Munglinup area east of Ravensthorpe, Western Australia, 1 June 1979, B.R. Maslin 4483 (*holo:* PERTH 00724262; *iso:* MEL, distributed as *A. tetragonocarpa*).

Openly branched, rush-like *sub-shrubs* 0.2-0.4 m tall, stems commonly prostrate or semi-prostrate. *Branchlets* terete, striate, sulcate and green between the yellow ribs, smooth or muricate, glabrous. *Stipules* triangular to lanceolate, 2-3 mm long, 0.5-1 mm wide at base, glabrous. *Phyllodes* resembling branchlets, occasionally continuous with branchlets or a few terminal ones reduced to horizontally flattened scales as in *A. tetragonocarpa*, distant, pentagonal-terete to \pm flat and linear, mucronate, pulvinus indistinct, 1-11 cm long, 1-2 mm wide, smooth or muricate, glabrous; 5-nerved in all (2 adaxial, 2 lateral and 1 abaxial), nerves rather prominent, 1-nerved on each face and upper margin flattened, c. 0.5 mm wide and nerve-like when phyllodes flat. *Gland* not prominent, situated

1-3 mm above base of phyllode. *Peduncles* 1 or 2 per axil, rarely more, 5-15 mm long, often reflexed, glabrous or appressed-puberulous; *basal peduncular bracts* solitary, usually caducous, minute; *heads* globular, cream or golden, loosely 6-11-flowered; *bracteoles* 0.5-1 mm long, \pm navicular, acute to shortly acuminate, sub-sessile, glabrous or sometimes margins ciliate. *Flowers* 4-merous; *buds* ovate to elliptic, occasionally narrowly elliptic, 1.5 mm wide, acute; *calyx* 1/4-1/3 length of corolla, gamosepalous, divided for 1/4-1/3 its length into oblong-rounded or more commonly triangular lobes, calyx tube nerveless or obscurely nerved; *petals* 2-3 mm long, flabellate-striate, glabrous, acute. *Pods* stipitate, 3-6 cm long, 4-5 mm wide, acuminate, \pm thinly coriaceous-crustaceous, curved, not raised over the seeds, acutely quadrangular due to broad, flat, "winged" margins which are c. 2 mm wide on each valve, glabrous, reddish brown, finely longitudinally reticulate on the faces. *Seed* longitudinal, oblong, 4-5 mm long, 3 mm wide, very dark brown to blackish, rather dull, finely rugulose; *pleurogram* not prominent, with a narrow opening at hilar end; *areole* 2-3.5 mm long, 1-2 mm wide; *funicle* filiform, c. 1 mm long; *aril* terminal, conical, 2-2.5 mm long, 1-2 mm wide.

Distribution. Southern Western Australia in the Eyre, Darling and Roe Botanical Districts. Occurs from Stirling Range (Stirling Range is east of Cranbrook) east to Cape Arid (c. 110 km east of Esperance).

Affinities. Until now the new species has been confused with *A. tetragonocarpa* Meisn. and it is probable that Bentham's (1864: 336) description and specimen citations under the latter name included elements of both species. *Acacia aemula* appears most closely related to *A. tetragonocarpa* and *A. cummingiana* Maslin but is readily distinguished from them both by the presence of phyllodes. These three species share a number of unusual inflorescence and carpological characters, for example, flowers 4-merous, petals striate, pods acutely quadrangular ("winged") and seeds with a terminal, conical aril. In its phyllode nervature, few-flowered heads and striate petals *A. aemula* appears to be also related to the more northerly distributed species, *A. volubilis* F. Muell. from which it is distinguished by \pm straight stems, generally longer phyllodes and 4-merous flowers. As discussed below, *A. volubilis* is a possibly extinct species known only from the type.

Etymology. The specific epithet is derived from the Latin *aemulus*, meaning rivalling or more or less equalling. It alludes to the fact that the branchlets and phyllodes are superficially very similar and at first glance difficult to distinguish. However, upon inspection the (short) phyllodes are seen to have a gland on their upper surface and usually (indistinctly) pulvinate at their base.

Key to subspecies

- Stems and phyllodes smooth 7a. subsp. **aemula**
 Stems and phyllodes muricate 7b. subsp. **muricata**

7a. *Acacia aemula* Maslin subsp. **aemula**

Stems and phyllodes smooth and slender. *Heads* golden.

Other specimens examined. WESTERN AUSTRALIA: base of Mondurup, near car park, Stirling Range, R.J. Cumming 998 (PERTH); Condingup, T.C. Daniell 11 (PERTH); Pfeiffer Road, South Stirling, A.S. George 6304 (PERTH); W of race course, c. 4 miles [6.4 km] N of Esperance, A.S. George 9862 (PERTH); Cape Arid Point, G.J. Keighery 7831 (PERTH); West Mount Barren, E & S. Pignatti 1092 (PERTH).

Distribution. Southwest Western Australia throughout Eyre and adjoining Avon Botanical District (1:250,000 maps I50-11,12; I51-5,6,11). Scattered from Stirling Range (base of Mondurup Peak) east to Cape Arid.

Habitat. Grows on sand and sandy clay flats, also on rocky outcrops, in scrub and Mallee shrubland.

Flowering and fruiting periods. Flowers in late May to mid-June. Pods with mature seeds have been collected in late November.

Conservation status. A Priority 4 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

7b. *Acacia aemula* subsp. *muricata* Maslin, subsp. nov.

A subsp. *aemula* ramis crassioribus et plus manifeste costatis, muricatis (interdum excrementisa sparsis), *phyllodiis* muricatis subrigidis. *Capitulis* cremeis differt.

Typus: 16 miles [25.7 km] south of Jerramungup towards Albany, Western Australia, 2 October 1970, B.R. Maslin 1017 (*holo:* PERTH 00724254; *iso:* MEL, distributed as *A. tetragonocarpa*).

Acacia tetragonocarpa var. *scabra* Benth., Fl. Austral. 2: 336 (1864); *A. tetragonocarpa* forma *scabra* (Benth.) E. Pritzel, Bot. Jahrb. Syst. 35: 292 (1904). *Typus:* without locality, *A. Oldfield* s.n. (*iso:* PERTH-fragment, presumably ex K).

Stems thicker and more prominently ribbed than on the typical subspecies, muricate, excrescences sparse on plants east of Jerramungup. *Phyllodes* muricate, sub-rigid. *Heads* cream.

Other specimens examined. WESTERN AUSTRALIA: Stirling Range, A.M. Ashby 5001 (PERTH); locality unknown, 19 November 1972, T. Hales for A.M. Ashby Tag no. 45 (PERTH 00725250); SW of Peak Donnelly, Stirling Range, R.J. Cumming 985 (PERTH); 26 miles [41.8 km] E of Jerramungup, A.S. George 4406 (PERTH); Scaddan, H.E. Knox 1 (PERTH); c. 30 km ENE of Mount Barker, ?June 1984, P. Luscombe s.n. (PERTH 00725242); Stirling Range, Chester Pass, B.R. Maslin 4015 (PERTH); 11 miles [17.7 km] E of Ongerup, K. Newbey 241 (PERTH); West Kalbar, Albany District, R.D. Royce 6392 (PERTH).

Distribution. Southern Western Australia in the western part of the Eyre and adjoining Darling and Roe Botanical Districts (1:250,000 maps I50-8,11,12; I51-6). Disjunct, occurring from Stirling Range (southwest of Donnelly Peak) to midway between Jerramungup and Ravensthorpe, with one collection from Scadden (c. 50 km north of Esperance).

Habitat. Usually white sand, sometimes near watercourses, in open Mallee shrubland dominated by *Eucalyptus tetragona* or stunted *E. marginata*.

Flowering and fruiting periods. Flowers occur in late May and in June. Pods with mature seeds have been collected in mid-November and mid-December.

Conservation status. Not considered rare or endangered.

8. *Acacia carens* Maslin, sp. nov.

Frutex diffusus scopiformis usque ad 0.6 m altus. *Ramis* teretibus striatis vulgo glabris et viridibus praeter costas prominentes luteas. *Phyllodia* pauca et remota cum ramis continua rudimentaria stipuliformia 0.5-1 mm longa redacta sed interdum phyllodia subteretia usque ad compressa mucronata 1-2 mm longa expansa. *Stipulae* anguste triangulares usque ad angusto-oblongae, 1.5-3 mm longae. *Pedunculi* vulgo solitarii, 2-5 mm longi, plus minusve appresso-tomentoso-pubescentes; *capitulis* globularibus, 8 mm diametro, subconferim 13-14-floribus, bracteolis tomentosis. *Flores* vulgo 5-meri, alabastris obovatis apiculatis; *sepala* discreta ad circa 1/4-connata oblonga, marginibus tomentosis; *petala* flabellato-striata. *Legumina* linearia usque 10 cm longa et circa 4 mm lata, arcuata acuminata crustacea usque ad sublignea, plus minusve quadrangularia marginibus prominentibus planis vel leviter convexis 2 mm latis, glabra vel appresso-puberula. *Semina* (parum immatura) longitudinalia oblonga, 5 mm longa, arillo terminali et conico.

Typus: Cockleshell Gully area, Western Australia, 28 May 1973, C. Chapman s.n. (holo: PERTH 00722103; iso: CANB, K, MEL).

Open, broom-like, sub-erect, *shrubs* to 0.6 m tall. *Branches* terete, striate, deeply sulcate and green between the yellow ribs, smooth, glabrous except appressed-puberulous in axils at flowering nodes and sometimes at base of branchlets. *Stipules* narrowly triangular to narrowly oblong, acute, 1.5-3 mm long, c. 0.5 mm wide at base, glabrous or sub-glabrous. *Phyllodes* few and distant, continuous with branches, rudimentary and commonly represented as a minute, stipule-like appendages 0.5-1 mm long with a swollen base, sometimes expanded to minute, sub-terete to compressed, mucronate phyllodes 1-2 mm long with a gland on the adaxial surface. *Peduncles* mostly solitary, 2-5 mm long, tomentose to pubescent, hairs \pm appressed; *basal peduncular bract* solitary; *receptacles* tomentose-pubescent; *heads* globular, 8 mm diam. (when dry), sub-densely 13-14-flowered; *bracteoles* persistent, 1-2 mm long, oblong to lanceolate, acute to acuminate, sub-sessile, shallowly concave, conspicuously tomentose adaxially, hairs sometimes partially wearing away with age. *Flowers* mostly 5-merous, petals occasionally 6 on some flowers; buds obovate-apiculate, c. 1.5 mm wide; *sepals* 1/4-1/3 length of corolla, free or united for c. 1/4 their length, oblong, sub-acute, \pm glabrous except for conspicuously tomentose margins, dark brown, obscurely 1-nerved; *petals* c. 3 mm long, flabellate-striate, the central nerve slightly more pronounced than the rest and thickened at its apex. *Pods* linear, to 10 cm long, c. 4 mm wide, curved, acuminate, straight-edged or shallowly constricted between seeds, crustaceous to sub-woody, \pm quadrangular due to prominent, flat or shallowly convex, glabrous margins which are 2 mm wide on each valve, faces of pod somewhat obscurely longitudinally nerved and glabrous or appressed-puberulous. *Seeds* (slightly immature) longitudinal in pod, oblong, 5 mm long, 2 mm wide, brown; *pleurogram* open at hilar end; areole 3 mm long, 1 mm wide; *funicle* minute, abruptly expanded into a thick, conical, terminal aril.

Other specimens examined. WESTERN AUSTRALIA: Cockleshell Gully area [precise localities withheld for conservation reasons], C. Chapman s.n., 23 October 1977 (MEL, PERTH 00722065) and 27 April 1979 (MEL, PERTH 00722138), C. Chapman s.n., 28 May 1973 (CANB, K, MEL, PERTH 00722103), R.J. Cranfield & P.J. Spencer 7995 (PERTH), E.A. Griffin 2437 (PERTH), B.R. Maslin 6573 (PERTH) and M. Simmons 514 (PERTH).

Distribution. Southwest Western Australia on the border of the Darling and Irwin Botanical Districts (1:250,000 map H50-09). Known only from a very restricted area between Jurien (c. 200 km northwest of Perth) and Eneabba (c. 60 km northeast of Jurien).

Habitat. Lateritic uplands on gravel or sandy gravel in low heath.

Flowering and fruiting periods. The only two flowering specimens were collected in late April and early May. Pods with immature seeds have been collected in late September and late October.

Affinities. Until now, specimens of *A. carens* were referred to as *A. volubilis* F. Muell., presumably because both species have large, globular, few-flowered heads and 5-merous flowers with striate petals. Furthermore, *A. volubilis* has very reduced phyllodes which resemble the striate branches, thus rendering it vegetatively superficially similar to *A. carens*. Although *A. volubilis* is known only from the type (a flowering specimen) it can be distinguished from *A. carens* by its tortuous branches, recurved, sub-spinose stipules c. 0.5 mm long (only the thickened basal portions remaining, as blunt tooth-like projections, at most nodes), better developed and usually longer phyllodes, and gamosepalous calyx dissected to c. 1/2 its length into triangular lobes. As discussed below *A. volubilis* is a possibly extinct species known only from the type.

Acacia carens can be confused with short peduncle forms of *A. cummingiana* Maslin (see below), another species formerly confused with *A. volubilis* and which occurs a little to the southeast of the range of *A. carens*. Superficially *A. carens* and *A. cummingiana* have a similar habit, furthermore, they both possess rather large, globular, few-flowered heads, flowers with striate petals and rather large seeds with an open pleurogram and a terminal, conical aril. The differences between them are discussed below under *A. cummingiana*.

Conservation status. A Priority 1 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List. This species is known from only the four collections cited here.

Etymology. The specific epithet is derived from the Latin - *carens*, meaning lacking, and refers to the characteristic absence of normal phyllodes on this species.

9. *Acacia cerastes* Maslin, sp. nov.

Frutex glaber intricatus multiramis usque ad 1.5 m altus, *ramulis* tortuosis viridibus vel brunneis teretibus et striatis. *Phyllodia* rudimentaria vel projecturas minutas continuas cornuatas 1 mm longas redacta, teretia plerumque recurvata, nervis non manifestis vel in utroque latere glandis perobscuris, a glande obliquo prominente abaxialiter terminata, mucrone 0.5-1 mm longo, rigido et subulato sed non pungente. *Racemi* maxime redacti unicapitati ad basem bracteis brunneis persistentibus; *pedunculi* 3-4 mm longi; *capitulis* globularibus 30-floribus aureis, bracteolis atro-brunneis in alabastro leviter exsertis. *Flores* 5-meri; *sepalis* discretis vel partialiter connatis linearibus usque ad lineari-spathulatis, interdum inaequalibus. *Leguminum* valvae (fructi aperti) lineares, ad 4.5 cm longae, 3-4 mm latae, tenuiter coriaceae, inter semina constrictae et supra semina manifeste elevatae. *Semina* non visa.

Typus: Mount Gibson Station, between Wubin and Paynes Find, Western Australia, 29 August 1976, B.R. Maslin 4226 (*holo:* PERTH 00137634; *iso:* CANB, K).

Erect, intricate *shrubs* to 1.5 m tall, single-stemmed but much-branched from c. 0.5 m above ground level. *Bark* smooth, grey on main stems, green on upper branches. *Branchlets* terete, finely striate-ribbed (ribs yellow and tuberculate), tortuous, glabrous, olive green or brown. *Stipules* semi-persistent, triangular, to c. 1 mm long, scarious, dark brown. *Phyllodes* rudimentary, reduced to

minute, horn-like projections to 1 mm long, continuous with branchlets, terete, usually recurved, nerves not evident or very obscure on either side of the gland, terminated on adaxial side by a prominent, oblique gland; mucro 0.5-1 mm long, rigid and subulate but not pungent. *Inflorescences* extremely reduced 1-headed racemes; *raceme axes* < 0.5 mm long, subtended at base by 2, dark brown, scarious, oblong bracts 1 mm long and 1 mm wide, a vegetative shoot sometimes arising from apex of axis at anthesis; *peduncles* 3-4 mm long, glabrous; *basal peduncular bracts* 1 or 2, obliquely oblong-elliptic, dark brown, scarious, 1.5-2 mm long, 1-1.5 mm wide; *heads* not prolific, globular, 30-flowered, golden; *bracteoles* spatulate, 1.5 mm long, slightly exerted in mature buds, dark brown; claws to c. 0.5 mm long and gradually expanded into the lamina; lamina 0.4-0.6 mm wide, concave, scarious, ciliolate, sometimes puberulous abaxially at base otherwise glabrous, acute. *Flowers* 5-merous, few 4-merous interspersed; *sepals* free or partially fused, 1/2-2/3 length of petals, linear to linear-spatulate, dark brown on upper half, ciliolate at apex otherwise glabrous, sometimes the abaxial pair (subtended by the bracteole) smaller and/or shape different than the rest; *petals* 2.5 mm long, glabrous, obscurely 1-nerved. *Pod* valves (dehiscend) linear, to 4.5 cm long, thinly coriaceous, 3-4 mm wide, slightly to moderately constricted between seeds, obviously rounded over seeds, glabrous, dark brown; margins 0.5 mm wide, not thickened. *Seeds* not seen.

Other specimens examined. WESTERN AUSTRALIA: Mount Gibson Station, November 1952, C.A. Gardner s.n. (PERTH 00137626, PERTH 00719536 and MEL) and B.R. Maslin 6638 (PERTH); Ninghan Station, S. Patrick 1111 (PERTH).

Distribution and habitat. Western Australia near the border of the Austin and Avon Botanical Districts (1:250,000 map H50-7). Known only from Mount Gibson Station where it occurs in skeletal soil pockets on rocky hills, and at Ninghan Station (c. 40 km northeast of Mount Gibson Station) in a gully on brown sandy loam in woodland.

Flowering periods. Of the four flowering collections known, two were gathered in August and the other two in November. It is noted, however, that the plants of B.R. Maslin 6638 which were collected in early October, had finished flowering.

Affinities. *Acacia cerastes* is a most distinctive species on account of its tortuous branchlets and minute phyllodes (which are probably the smallest recorded for the genus). It is closely related to *A. daviesioides* C. Gardner on account of its continuous phyllodes and globular heads arranged in very short racemes which are usually bracteate at their base. *Acacia daviesioides* is most readily distinguished from *A. cerastes* by its glaucous to sub-glaucous, non-tortuous branches and its longer (2-10 mm, sometimes 20 mm), pungent, 5-nerved phyllodes. Also, its bracteoles are usually inconspicuous and its calyx is gamosepalous, shallowly to deeply dissected, and often < 1/2 length of the petals. Pods and seeds may show additional differences, however, carpological material of *A. cerastes* seen to date is very inadequate (comprising old, dehiscent pod valves). The branches on *A. daviesioides* are normally \pm straight, however, in some specimens (including the type) they are flexuose and have minutely tuberculate ribs as in *A. cerastes*. *Acacia daviesioides* occurs mainly between Mingenew southeast to Ballidu-Kalannie in the South-West Botanical Province, some 80 km to the west of Mount Gibson Station. It also has outliers in the Eremaean Botanical Province, one on Jingemarra Station about 200 km north of Mount Gibson Station, another north of Mount Jackson about 200 km southeast of Mount Gibson Station.

Superficially the new species may be mistaken for *A. restiacea* Benth., however, the latter is easily distinguished by its straight branches, absence of phyllodes (except occasionally at the base of the stems where they are 7-25 mm long), long racemes (1-6 cm) with 4-12 heads and very short calyx

(c. 1/6 length of corolla). *Acacia restiacea* mainly occurs from the north of the Murchison River south to Chidlow and east to near Merredin, also at Hospital Rocks (c. 90 km west of Menzies) and an early collection from Mount William in the Darling Range.

Conservation status. A Priority 1 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List. Although further survey is required to accurately ascertain the conservation status of *A. cerastes*, current indications are that it is very localized.

Etymology. From the Greek - *cerastes*, a horned serpent. An allusion to the serpentine branches supporting extremely reduced phyllodes.

10. *Acacia cummingiana* Maslin, sp. nov.

Suffrutex decumbens effusus junceus usque ad 0.4 m altus. *Ramis* teretibus striatis viridibus glabris praeter costas luteas. *Phyllodia* ad squamas continuas tenues applanatas horizontaliter anguste oblongas usque ad anguste triangulares 1.5-4 mm longas redacta. *Pedunculi* squamarum in axilla solitarii vel geminati, 4-15 mm longi, glabri; *capitulis* globularibus, circa 8 mm diametro (in sicco), vivide pallido-aureis, plus minusve apertis 8-12-floribus. *Flores* tetrameri, alabastris obovatis apiculatis, 2 mm latis; *calyx* gamosepalus, petala circa duplo brevior; *petalis* flabellato-striatis. *Leguminum* valvae (fructi aperti) 4-7 cm longae et 8-10 mm latae, stipitatae acuminatae coriaceo-crustaceae leviter curvatae, acute quadrangulares marginibus alatis planis 3-4 mm latis, glabrae. *Semina* apparenter obliqua oblongo-elliptica, 5.5 mm longa, arillo terminali et conico.

Typus: NE of Dandaragan, Western Australia, 24 May 1979, *R.J. Cranfield* 1261 (*holo:* PERTH 00722049).

Sprawling, straggly, rush-like *sub-shrubs* to 0.4 m tall, the wiry stems to 1 m long and commonly entangled in associated vegetation. *Branches* straight to shallowly curved, terete, green except striate with yellow, \pm raised ribs 0.2-0.5 mm apart, glabrous. *Stipules* (see discussion below). *Phyllodes* reduced to continuous, thin, horizontally flattened, narrowly oblong to narrowly triangular scales 1.5-4 mm long. *Stipular traces* running into the scales. *Peduncles* 1 or 2 in axil of scales, 4-15 mm long, occasionally recurved from the base, glabrous, finely longitudinally sulcate; *basal peduncular bract* solitary, persistent, \pm triangular, 1-1.5 mm long, glabrous or sparsely puberulous, dark brown, thickened at base; *heads* globular, c. 8 mm diam. (when dry), bright light golden, somewhat loosely 8-12-flowered; *bracteoles* persistent, \pm navicular, 1-1.5 mm long, fimbriolate otherwise glabrous, dark brown. *Flowers* 4-merous; *flower buds* obovate-apiculate, 2 mm wide; *calyx* c. 1/2 length of petals, gamosepalous, divided for 1/3-1/2 its length into \pm broadly triangular, fimbriolate lobes; *calyx tube* glabrous, brown, rather obscurely striate; *petals* 3 mm long, glabrous, flabellate-striate. *Pod valves* (dehiscid) stipitate, 4-7 cm long, 8-10 mm wide, acuminate, coriaceous-crustaceous, shallowly curved, scarcely raised over seeds, acutely quadrangular by broad (3-4 mm wide), flat "winged" margins, glabrous. *Seeds* (one old seed seen) obliquely placed in pod (judging from empty seed chambers), oblong-elliptic, 5.5 mm long, 4 mm wide, chestnut brown, dull; pleurogram obscure, open at hilar end; *areole* 4 mm long, 2 mm wide, *funicle* not seen; *aril* terminal and conical.

Other specimens examined. WESTERN AUSTRALIA: NE of Badgingarra, *T.E.H. Aplin* 3150 (CANB, PERTH); NE of Dandaragan, *R.J. Cranfield* 1261 (PERTH); 4 km from Brand Highway on West Wannamal Road, *R.J. Cumming* 715 (K, PERTH); 3.3 km W of Barberton West Road on Wandawulla Road, *R. Cumming* 3572 (PERTH); farm N of North West Road, W of Moora,

E.A. Griffin 5101 (PERTH); 8 miles [13 km] E of Dinner Hill, *R.T. Lange* 60 (PERTH); 8 miles [13 km] W of Barberton, 26 September 1971, *A.H. Popplewell s.n.* (PERTH 00725277); Watheroo National Park, *R.D. Royce* 9637 (PERTH); 10 miles [16 km] W of Moora, *E. Wittwer* W832 (PERTH).

Distribution. Southwest Western Australia at the northern extremity of the Darling Botanical District and the adjacent southern extremity of the Irwin Botanical District (1:250 000 maps H50-10,14). Restricted to a small area from Watheroo National Park (c. 40-60 km northwest of Moora) south to Wannamal (c. 25 km northeast of Gingin).

Habitat. Grows in sand or lateritic gravel in closed heath or low open woodland (of *Banksia prionotes* and *Eucalyptus totidiana*) over heath. Collectors notes accompanying *R.J. Cumming* 715 show the species confined to a creek line, halfway up the slope of a small breakaway.

Flowering and fruiting periods. Flowers mainly in May and June, but also recorded for August. Specimens with immature pods (sometimes with flowers persisting) have been collected in late September and early October.

Affinities. Until now this new species was confounded with *A. volubilis* F. Muell., a rare (perhaps extinct) species. Because of past confusion surrounding the application of the name *A. volubilis* a number of taxa, including *A. cummingiana*, had been referred to it. It is not surprising that *A. volubilis* and *A. cummingiana* were confused because they share some distinctive floral features, namely, large, globular, few-flowered heads and striate petals. Furthermore, *A. volubilis* has very reduced phyllodes which resemble the striate branchlets, thus rendering it vegetatively superficially similar to *A. cummingiana*. In addition to possessing phyllodes, *A. volubilis* is distinguished from *A. cummingiana* by its tortuous branchlets, appressed-puberulous peduncles and 5-merous flowers. Furthermore, *A. volubilis* has a pair of stipules flanking the base of its phyllodes. Each stipule, as well as the phyllode, is served by a vascular trace. In *A. cummingiana* (and *A. tetragonocarpa*), however, the equivalent three traces enter the scale. This suggests that the scales in these species are homologous to fused phyllodes and stipules.

Acacia cummingiana is closely related to *A. tetragonocarpa* Meisn. on account of its habit, phyllodes reduced to continuous scales, 4-merous flowers with gamosepalous calyces and striate petals, and quadrangular pods with wide, flat margins. However, *A. tetragonocarpa* is distinguished from the new species by its narrower pods (4-5 mm wide) with longitudinal seeds and by its floral characters, i.e. heads 1-4-flowered, flower buds cylindrical to narrowly obovate and 1 mm wide, and calyx c. 1/3 length of corolla. *Acacia tetragonocarpa* occurs in swampy or seasonally wet habitats in forest regions to the south of *A. cummingiana* (i.e. Perth to Margaret River and Albany).

Also related to *A. aemula* (see above).

Specimens of *A. cummingiana* with short peduncles can be confused with *A. carens* (see above), however, *A. cummingiana* is most readily distinguished in the following ways: phyllodes reduced to flattened scales 1.5-4 mm long, stipules seemingly fused with the scales, peduncles glabrous, flowers 4-merous, calyx gamosepalous with triangular lobes, pods 8-10 mm wide, stipitate, acutely quadrangular with margins 3-4 mm wide and seeds seemingly oblique.

Conservation status. A Priority 3 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

Etymology. Named after Russell Cumming in recognition of his valuable contribution to the taxonomy of southwest acacias through his perceptive field observations and numerous, well-preserved collections.

11. *Acacia volubilis* F. Muell., Fragm. 10: 98 (1877)

Typus: Boxvale, Western Australia, *Julia Wells s.n.* (*holo:* MEL; *iso:* K, PERTH).

Branchlets tortuous, having the appearance of *Alexgeorgea nitens* (Restionaceae), terete, glabrous or sparsely appressed-puberulous, obscurely and finely tuberculate, striate, ribs slightly raised. *Stipules* c. 0.5 mm long, recurved, sub-spinose, only the thickened basal portions remaining as blunt tooth-like projections at most nodes. *Phyllodes* distant, resembling branchlets but not continuous with them, the basal articulation difficult to observe, pulvinus absent, rudimentary (<1 mm long) to 9 mm long, 1 mm wide, pentagonal-terete, thick, straight or shallowly curved, mucronate; 5-nerved in all, midrib prominent and raised on each face, upper margin 2-nerved, flat and 0.5 mm wide, lower margin 1-nerved. *Gland* not prominent, circular, situated on upper margin of phyllode between the two adaxial nerves, c. 2 mm above the base on longest phyllodes. *Inflorescences:* see discussion below.

Distribution and habitat. Known only from the type collection which is annotated by Mueller as having been collected by Julia Wells from “Boxvale” (in the protologue Mueller gives the type locality as “Ad Boxvale trans urbem York”). The precise location of “Boxvale” is unknown, however, current indications are that it is probably somewhere in the vicinity of Quairading, about 70 km east-southeast of York. According to Erickson (1988) “Boxvale” was the name of a property owned by John R.F. Wells, and it is assumed that it is here where his unmarried sister, Julia, resided during the late 1870’s when she collected plants for Mueller. There is circumstantial evidence to suggest that “Boxvale” may have been an earlier name for a property known as “Coraling”, located near Coalling Hill, about 12 km southeast of Quairading. This assumption is based on the following quotation from Eaton (1979: 42): “It was during 1860 that John Wells selected land at Coraling Springs. He built a small hut and grazed a few sheep on his holding. It was in 1883 therefore that Charles Heal bought “Coraling” a block of 640 acres, from John Wells.” The property is owned to this day by descendants of the Heal family. That “Boxvale” was probably located somewhere near Quairading is supported by the fact that Julia Wells was reported by Mueller (1878: 3) as having collected *Comesperma volubile* Labill. from the Cubbine Hills which are located 15 km north of Quairading towards Cunderdin. Furthermore, *Acacia anarthros* Maslin which was originally collected by Julia Wells from “Boxvale” (*fide* Maslin 1979) is an uncommon species known only from two general areas, namely, about 40 km south of Quairading and in the New Norcia district.

Typification. Both the holotype at MEL and the isotype at K are annotated “*Acacia volubilis* F. v. M. Boxvale. Julia Wells” by Mueller and comprise a single sheet supporting a number of small pieces of sterile stems together with detached flowers in a packet. While the stems appear to represent the same taxon, the flowers on these two sheets are significantly different and most probably represent different species. On both specimens the heads were probably globular and c. 10-flowered (judging from the receptacles), the flowers 5-merous and rather large, the calyx divided to c. 1/2 its length into triangular, fimbriate lobes, and the calyx tube is glabrous. They differ, however, in the following ways.

(a) MEL specimen. *Peduncles* appressed-puberulous, the hairs short and shallowly curved; *calyx* scarcely 1/2 length of corolla, tube obscurely 5-nerved; *petals* 2.5 mm long, sparsely puberulous at apices, flabelliform-striate.

(b) The K specimen flowers. *Peduncles* densely hispidulous, hairs spreading, rather long and straight; *calyx* slightly exceeding 1/2 length of corolla, tube rather prominently 5-nerved; *petals* 3 mm long, glabrous, with a single, thickened, central nerve.

The protologue clearly describes the flowers of the MEL specimen and it seems most likely that the flowers on the K specimen belong to a species other than *A. volubilis*.

Affinities. In the past many apparently aphyllodinous taxa with few-flowered heads and striate petals (including *A. carens* and *A. cummingiana*) were referred to *A. volubilis*, however, it is now known that this is a rare, possibly extinct, species currently known only from the type collection. In the absence of pods for *A. volubilis* it is difficult to be certain as to its true affinities. Nevertheless, it seems likely that it is less closely related to *A. carens* and *A. cummingiana* than it is to *A. aemula* (see discussion above under this species).

Conservation status. The species is currently gazetted a Declared Rare Flora-Extant Taxa on the Department of Conservation and Land Management's Declared Rare and Priority Flora List. If *A. volubilis* is not extinct then relocating it could prove troublesome even if the plants are in flower because I suspect that the species will be an insignificant sub-shrub, perhaps with a scandant or sedge-like habit, and may well grow \pm concealed within dense heath. It is unfortunate that the type does not include a collecting date because without it the flowering period is unknown. A further complication is the uncertainty concerning the location of "Boxvale", currently the only locality known for the species (see discussion under *Distribution and habitat* above).

Acknowledgements

Peter Luscombe is thanked for providing notes on the discrimination of *A. applanata* and *A. willdenowiana* at Woogenilup (east of Mount Barker). Karina Knight is thanked for her competent technical assistance and Richard Cowan for providing the Latin descriptions. I am very indebted to Mr Ian Elliot (Department of Land Administration, Midland, W.A.) for providing valuable information concerning the possible location of "Boxvale" (see discussion under *Acacia volubilis*). The work was undertaken with some financial assistance from the Australian Biological Resources Study.

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